

U.
S.

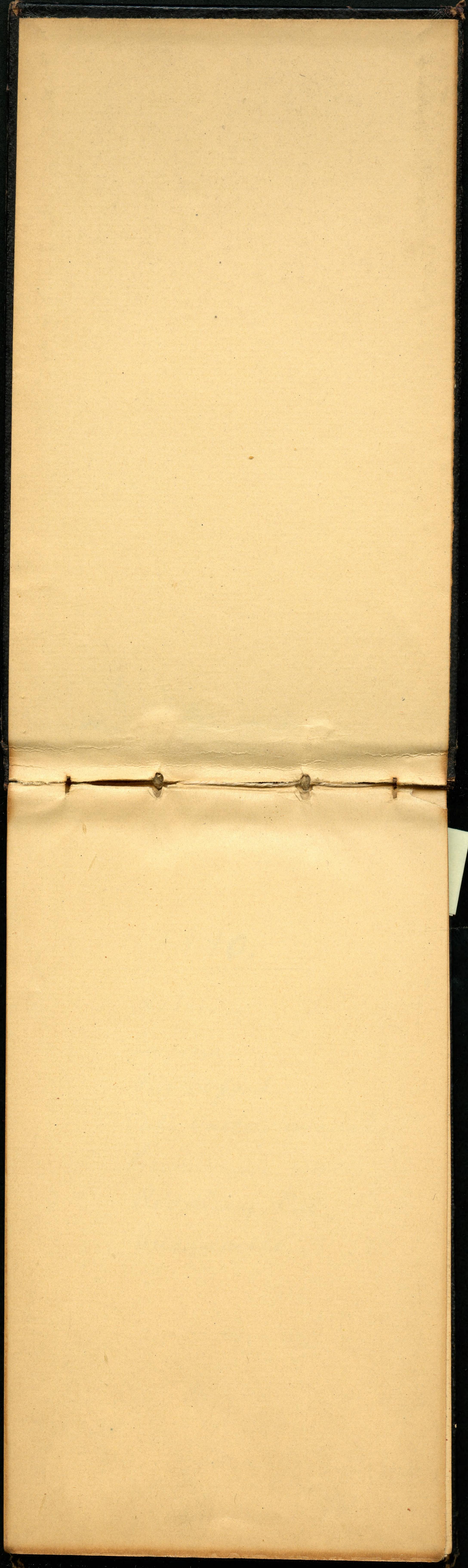
Dall

1890.-1

Astoria, Eugene, Ore.

Cal. gravel. Valley
of Cal. Livermore.

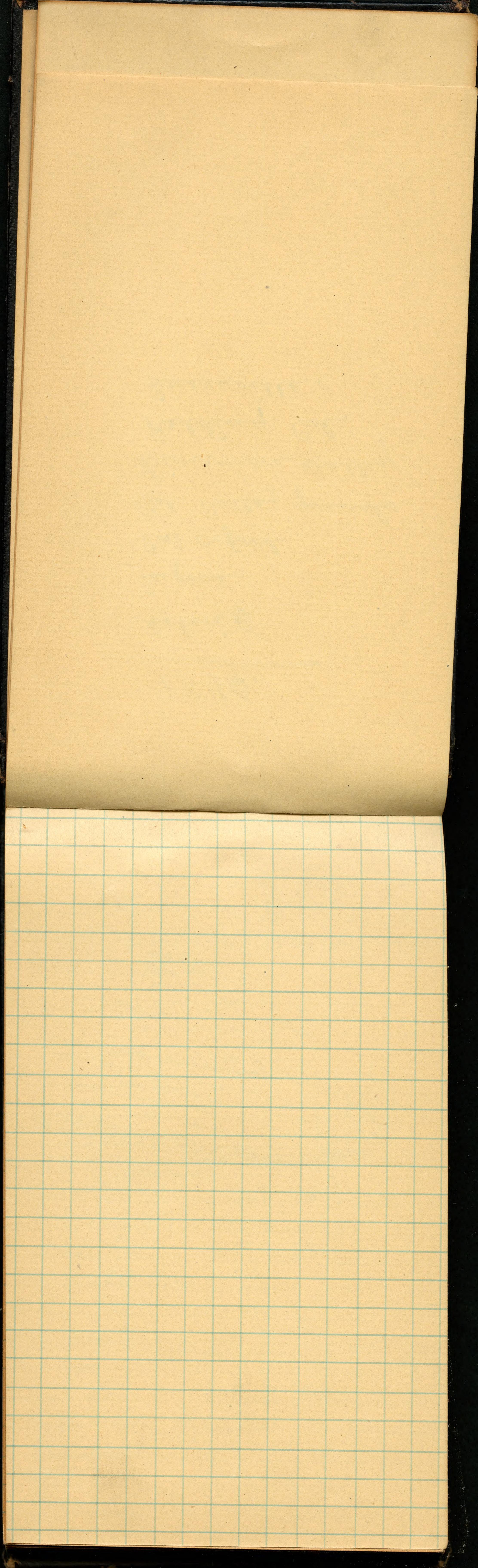
S U R V E Y.



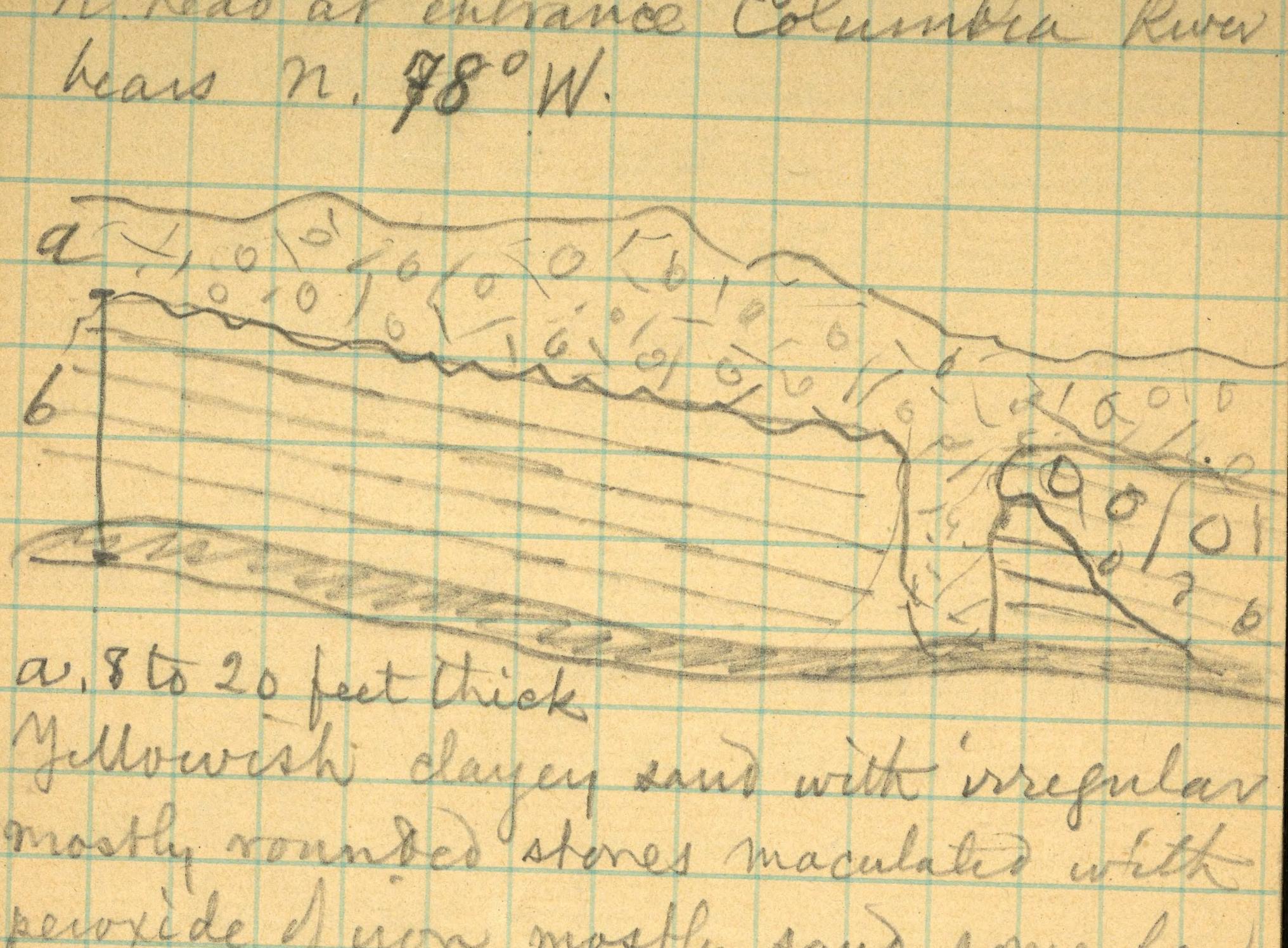
10

1890.

Astoria
Eugene
Port Orford
Cal. Valley gravels
Livermore valley
Redding, Cal.
Sausalito.



Smiths Point, Young's Bay.
Astoria west of town, last of
the high hills on N side of the
Columbia bears N. 50° W. The
N head at entrance Columbia River
bears N. 78° W.



a. 8 to 20 feet thick
Yellowish clayey sand with irregular
mostly rounded stones maculated with
peroxide of iron, mostly sand some few
clayey with traces of marine fossils, also
more or less gravel; not regularly bedded
and penetrating into the layer below
It dips about 16° S and about the
same strike to S E by S. Exposure abt
15 ft. vertical at highest. Composed of
regular thin layers of chiefly a
bluish gray clay with numerous
fractures lined with peroxide of
iron which develops more or less

merously as the surface dries. The layers contain little sand, some do not show any, but the differences are apparent by the weathering and appear in their sequence to follow with a certain regularity. Here and there a little gravel is mixed in one of the layers and in these gravelly layers are also small fragments of bivalve shells, the most perfect being a small slightly concentrically undulated *Pseudammonium* less than half an inch long usually. *Acila* was also observed and a small *Waldheimia* like the young of *Laqueus californicus*. Occasionally in the upper layers of this formation the clayey parts have formed concretionary nodules in part fossiliferous. They are arranged in thin layers of a single series of nodules. These contain foraminifera and I saw a few *Solariella* of small size in one fragment.

also carbonaceous particles

and fragments of small bi-

valves chiefly mactans.

This disappears under the small talus at the foot of the section. The beach of the river not far distant is composed of the pebbles and small boulders of the hard sandstone from upper layer (a). There are

also in this layer rare rounded

small pebbles of a very hard

bright pink ^{minutely} granular rocks whether

crystalline or sandy schist I did

not determine.

near Foargue Pt the same formation was

recognized, but layer (a) seemed thick

and the regularity of the layer (b) was

much broken up. As far as could

be determined in the absence of any

road or path at the foot of the bluff,

which is fenced off into lots mostly

which are built upon), the formation

is the same all along the bluff behind

the town which is largely built

upon piles. The High or Public ³ Block

building is at about the western end

of the front and on each side of this the hills rise higher than elsewhere, perhaps 150-200 feet in all. Behind the slopes which have been graded and built upon, there is on the west part of the bluff facing northwardly a fine section with thirty or forty feet of the ^{gray} clayey layers (3) exposed at an angle of 45° - 60° , surrounded by as much more of the yellowish alluvial (a) which here and there descends, in dykes, into the clays. The clays dip about 26° SSE. but are not invariable and in some places are broken down or show signs of having crept. The alluvial (b) has crept over the clays on many slopes and where cleared away leaves fine examples of slickensides. On Chemamus St. a gradual slipping of a bank of this kind has pushed the plank sidewalk at its base nearly two feet out.

of line. The upper margin of the clays is not always well marked in the sections being sometimes ~~not~~ indistinguishably merged with the alluvial, and similarly colored with iron derived from the alluvial.

The fossils are beside the *Purpura* *argus* a variety of bivalves, *macoma* *acila*, a grooved *yoldia* like *lancolata*, a smooth one like *amygdaea*, a truncate one like *obesa*? A large *Pecten* ^(corrosensis?) with stronger ribs than *caurinus*. A *mesalia* or *Turritella*, slender with elevated spirals, two inches or less long. A large coarsely grooved *Dentalium* (like *albatross* sp. but less curved & more cylindrical) a small *Matica*, a *Cytherea*, an *Atria*, a large *Lima*.

From Shoalwater Bay Id. White showed me siliceous casts of the *Purpura*, this *Dentalium*, the *Matica*, the *Cytherea*, a *Macoma* and *Atria* zigzag, which would suffice a very late Eocene or Early Miocene age for these clays.

It should be noted that in the upper part of the clays the fossils, or at least part of the bivalves seem to have been fossilized in a sandstone, washed out and reburied in the clays, so that between the valves, or on one side of a single one, there will be a ^{soft} coarse sandstone while the fossil is otherwise entirely embedded in a dark waxy clay.

Yonie Pt. itself is a basaltic mass and on top of the ridge behind the town according to Prof. Condon there is a layer or strip of talc, fragments of which are found on the beaches. About one block west and on the south side of the street from the Union Pacific dock where a fire had burned away the planking of the sidewalk and building there is a very large solid block ten or twelve feet square and fifteen feet high probably ⁶ of basalt though I could not

get at it to test with the hammer. The original beach at its foot was abundantly strown with large fragments of the same stone. I looked carefully along so much of the beach as is at present exposed for concretions but found none though formerly there were a good many of them. They were burned for lime in early days, lime being scarce in this region, and the bed from which they were derived being very low down & near the water's edge has long been covered by plank roads, plies and buildings, so that little erosion has been likely to take place of late years and the supply is probably permanent by cut off.

Alvinia zigzag (or *mathewsoni* Gabb) was found in concretion of the shale washed out on beach at Astoria by Prof. Condon and also at Tillamook (+ shoalwater Bay, White) heard of it at Bellingham Bay but did not see specimens.

Eocene on Duwamish River 12 m from Seattle, Turritella, small

cystinea etc.

- *Risbellites?* Eocene of Astoria / concretion

Miocene Cape Arago & Yaquina Bay.

Pt Arago is Eocene & Rocky Pt is on

~~inland~~ on Coos Bay

~~so the~~ is Miocene

Big Scallopia from near Springhill bridge a few miles from Eugene
Also from Salem Oregon

Sirocomia-like shell cap. of Eocene other from Eugene Miocene

Risbellites from ^{Eocene} (18) Coos Bay

+ Yaquinae Miocene (all?)

North Umpqua River Forks

Melanopsis like shell, 20 miles

east of Roseburg near Patterson

Mills Oregon

Pompholyx effusa typical from

the river between the lakes Klamath

Carinifex recent one from the

same place called Link River

Carinifex fossil from Silver L.

Lake Co. Oregon.

Planorbis from Link River

Quaternary from Lighthouse at

Cape Blanco Ore. 210 ft above

the sea; also at Cape Arago, Tilli-

noch and Chetco Bay where

they are only 50 feet above the sea

Prof. Condon. Shells as follows see

Wells further on in book

Smith's quarry, East about mile
from Elizone. In Miocene
rocks with *Mytilus Modiolus*, *Mac-
ta solen*, *Natica*, *Nevirita Purpurea* +
Lirofusus. Rock grayish sand from
soft to quite hard, weathering yellow
ish dipping SSW by about 6° covered
by alluvial, upper layers broken
ups, lower ones more massive
with several lines of specially
fossiliferous rock crammed
with crushed fossils mostly
molds but above retaining thin
lime which has however been re-
crystallized into spar. Thickness
of rocks exposed about 37 feet
but not more than 20 feet in any
one vertical cut visible

about half bridge. Three miles E from Encino
E side of river begins
just south of new abutment
Strata dip eastward between 5°
and 8° the section being a little
east of S and W. of N. along
the river (Big scalaria found
near this spot) for about a
mile; measured thickness of
the rocks from the abutment
of the new bridge (1890) to the
point where they dip below
the river and form a bar at
low water about 160 feet.

This is an excellent section of
the Miocene which is here
unconformably overlaid
by 5-10 feet river alluvial
the largest gravel just over the
edge of the Miocene rocks
top of hills capped by basal
according to Prof. Cope, the
surface under laid by Miocene
is gleyed very wet has been //

eroded before the deposition
of the gravels, the Miocene
rocks appear all around
the edges of Coquille Valley
except where they dip into
deep valleys & are obscured
by alluvium or where they are
covered by basalt. They
overlie the Eocene at Coos
Bay, where they form the
landward slope the sea
ward slope being formed by
the edges of the Eocene.
The first sheets occur at
the islets at the mouth of
the Coquille River above
this Eocene forms the
coast to
where it is succeeded by
the Miocene which extends
to

Up to Port Orford the coast is composed of schists & the last serpentine hill is at Port Orford. Between Orford & Blanco and at the foot of the latter is a small strip of miocene. Six or seven miles north at village of Denmark is a stone quarry based on metamorphic rock above which are 4-500 feet of what Prof. C. takes to be Eocene rock but which bears no fossils, a sandstone somewhat altered in the central part of the N fold. Then a low coast to the mouth of the Coquille but inland where the land rises to 500 feet or so, Cardito planaria has been found. off the S head of the Coquille are several solitose islets with felspathic and hornblanitic crystals. In the sheltered rocks between these is found quartzite about 80 ft above the sea B

North of the Coquille the shore is sandy until Cape Arago is reached. This is Eocene. Going inland at Rocky Pt. about ~~six~~⁴ miles in, the Miocene begins. Across the entrance there are 20 miles of sand until the mouth of the Umpqua is reached. There is another large mass of rocks referred by Prof. C to the Eocene and supposed to be continuous with the known Eocene of the upper north fork of the Umpqua 20 miles E of Roseburg.

The miocene appears on the coast a little south of Yaquina Bay, without any Eocene until Astoria is reached.

Drains at the base of the coast into on the Siletz reservation a fine *Nautilus* of the pomphilus type was collected, probably Eocene. At Astoria the Eocene forms

ly appeared a bed with
concretions among which
Aturia was collected. These
were washed out on the
beach & buried for nine
years ago & the town
has covered the old
beach so they are no
more accessible. In
Shoalwater Bay it appears
again. There is a fine
exposure of quaternary
at Shoalwater Bay about
30-40 feet above sea.
at Duwamish 12 miles from
Seattle there is Eocene
in the Wallabout valleys
from Cowalhis to Albany
the river is forced to run
to run to the Eastward
by a fine Eocene mountain
mass
near Sheridan Cardita shells
have been found. Franklin
County.

Shoalwater Bay Pleistocene

Schistotheces

Saxidomus squamiferus

Mytilus islandicus

Alcyona luteola Purpura cris.

Monetaria annularis pala

Tapes staminea

Pliocene immediately under
the above has

Buccinum cyaneum

Mytilus with strong divaricate

Crepidula sp. ribs

Pecten medium size sharp

ribs rather inflated

Panopaea

Jaguarine Pliocene

Zirphaea crispata

Placuna ovata macrocephala

Pholadidea penita *natica* *truncata*

Saxidomus squamiferus

" *arata* *magister*

Tapes staminea *Purpura cris.* 6

Maqinna 10-10 ft
8 ft above a
quaternary

Bandon quaternary at the

mouth of the Coquille. (soft)

+ 60

Saxidomus squolidus

Schizothaerus

Purpura crispata

Prione oregonensis

Margarita Beecheyana

Mya truncata

Macoma sabatieri

Teretibratulina

Dasyicava rugosa

Aemaea like small *Cumingii*

+(*Codium corbis*, Tillamook)

Placanaria moorei solisma

Margarita papilla

Ampibia elongata

Oncotropis cancellata

+(*Aemaea nitra* Tillamook)

Ocineta interposta

Cape Blanco quaternary

200 ft

Schizothaerus

Saxidomus squamidens

Mya truncata

Tapes Maumidea

Macoma imbricata

Warren Lake shell mark

Concreted with silex

Cerithium angulata

rounded large

" or *Planorbis* very large

angulated at base

Valvata rounded smooth large

Pompholus

Planimicula

Argyloceras

Retzia

15

Crooked River E of Cascades

Old Lake Basin - *Argyloceras*

Mya - *Tapes* *Argyloceras*

Union Co E. Oregon

E. slope of Blue Mts

near Snake River

Large Vivipara

Melanian like *Gaudichia*

Lithasia?

Near Powder River and the
old Emigrant road.

Melania

Vivipara

Lithasia antiqua

Small form like *Bittium*

Redding. Cal

The fossiliferous sandstones of Redding seem to be unconformably adjacent to the metamorphic schists of the valley further up. Near Middle Creek the valley which is narrow begins to widen and its floor is formed by the irregular edges of the schists where the floods have laid them bare. Above them is the coarse reddish gravel containing many rather large cobblestones. One third of the way, or so, from the Middle Creek Station to Redding the schists come to an end and there is a series of somewhat compacted strata, the lower of which are sandstones, mostly a good deal tilted & dipping to the SSW. Over these lie (1) a ten or twelve foot stratum of gray sand with enough clay in it to give

the mass stability. This bed is
remarkably uniform in texture
and free from pebbles or other
fragments and showing no
trace of fossils. It is on the
whole more horizontal than
the sandstones and visible
over not to exceed half a mile
of the section. Over it are the
same coarse gravels which
cover the schists, but here the
gravels seem almost as quite
conformable to the sandy bed.
The fossils collected were obtained
at the first outcrop of sand-
stone on the railroad cutting
west of the track on the way
from Redding to Middle Brook.
Very few have any of the form
of the shells preserved; a *Voluta*
littoralis or allied shell much
resembling *Lingula* externally,
rather long (2 in.) and spirally
welted, showed the most

Linsayville Cal

Mr. Frost found impression
of radiated bivalve perhaps a
Rhynchonella in a small
stone pebble in the gravel of
the head of the valley above
Stanley Brown's camp near Mr
Long's house.

He also has mass of Festian
shell rock with
Acita like castaneous or Lyalli
area

Trigonia!

Cyrena?

Cytherea

Probably Chico.

Aetnaea etc

from Minishaw road, Butte Co

20 miles SE of Chico, Cala

Stockton Cala.

Jerome Hawes esq

For many years devoted to boring artesian wells in the valley for water, oil, gas etc. and has probably done far more of this work than any other man in the state.

In boring in the valley away from the vicinity of the foothills the strata every where show great uniformity. They consist of clays and sands the beds of clay getting relatively thicker as they descend the beds of sand usually 6-8 feet thick remaining unchanged while the clay will sometimes attain more than 100 feet without a break. The layers are perfectly horizontal or at right angles to the axis of the bore. Gravel is rare, at about 200 feet in Stockton there is a layer of which the pebbles reach the size of cobblestones. This

layer at the well in the Cawthron
yard is about 5 feet thick and
also at the Hawes gas well, but
laterally from a line drawn be-
tween these two it diminishes
in thickness and runs out to
a few feet at the distance
of a few blocks from this axis.
From this to about 1400 feet
there are merely alternating
layers of clay and coarse sand.
About 1400 feet (Hawes gas well)
there is more gravel with round-
ed pebbles usually rather small
not exceeding $2\frac{1}{2}$ inches in di-
ameter, mostly quartz or clay
porphyry; usually with a thin
black coating of iron oxide but
occasionally without it. The
greatest depth yet tested is about
2100 feet but no rock was yet
encountered at that depth; at
1100 feet the water begins to be some-
what saline, contains magnesia salt,
and some borax besides bubbles of

gas and traces of petroleum.
At 1400 feet there is less salt
(not very perceptible to the taste)
but more borax and the water
has a temperature of 90° or
thereabouts. Below the gravel
it becomes more saline again.
It is not potable below
1100 feet. 20 miles east from
Stockton at the edge of the foot
hills at about 100 feet struck
a layer of water worn granite
cobbles stones in a volcanic
matrix, after boring through
this over 100 feet, came to
gravel & sand as in the valley
and got no more rock in
that boring which was carried
to over 900 feet.

The gravel is traceable to the Si-
erras the sand and clay from
the Sierra side is different in
texture and color from that on
the Coast Range side of the
valley. But on the latter side
after boring through about

500 feet of Coast Range debris the drill comes to fine gravel and thereafter continues in it, showing that the latter underlies the Coast Range talus. At the southern end of the valley the flows of water are larger, purer and more powerful than in the northern part and the decrease is so gradual that Mr. Hawes thought that the artesian water of the valley proceeds more from the South than from any other direction.

No fossils are found in the valley borings. Once he found a spiral shell when boring near the foothills. Small twigs and particles of wood are occasionally brought up but no large pieces. The harder nodules of the clay sometimes are perforated with holes like the borings of some

animal. These tunnels, rarely

larger than the little fingers, are

sometimes coated with a limy

deposit internally.

At about 1000 or 1100 feet
a limy or alkaline layer,
quite thin, was sometimes
passed through. (Specimen)
Some pebbles from 1400 feet
(specimens) were evidently
water-worn and mostly quartz.
The water from this depth has
slightly milky tinge until it
gives off its gas when it be-
comes nearly clear and of
a pale greenish tint in mass.

The conclusions from these data
are that the valley as an es-
tuary is older than the volcanic
conglomerate and than the
present elevation of the Coast
Range. That deposition first from
the Sierra and subsequently also
from the Coast Range, has

fore or continuously and without
out material change of ~~stage~~
or tilting of the deposited strata
though they may have sunk.
That the throwing out of the
volcanic conglomerate did
not interrupt the general
detrital action which may
even be said to be going on
still. That during this deposition
the valley was a fresh water
lake or estuary which did not
sustain marine life, or at
all events was not favorable
to its existence, and at the
same time offered no suit-
able conditions for freshwater
shells.

Livermore Valley

Oct 2 - 6/90

The Livermore valley is the largest valley of the Coast Range, north of Mt. Hamilton and unlike most of the valleys of this range is well watered, agriculture requiring no irrigation the rainfall about 12 inches

The entire watershed is discharged through Niles canon into San Francisco Bay by the so-called Alameda Creek. Within the valley there are a large number of creeks each draining a smaller valley or canon of its own.

The south easternmost is the arroyo del Riojo which discharges by a permanent stream into a small rounded valley from which there is a narrow passage into the Livermore valley proper. Here the

hills are composed of miocene sandstone and gravelly strata. The lower layers near or in the bed of the creeks are composed of river pebbles mixed with worn and broken miocene shells, oysters, Venus Laces, and other bivalves with an occasional Gasteropod crushed together with many small quartzite pebbles worn smooth. The rock is very hard and the material clearly the compacted result of the beachworm marine fragments and the gravel of streams, the layers a good deal twisted but the strata composed of them conformable with those above. The dip is entirely variable but on the whole the strata dip eastward for a few to nearly 30 degrees. A mile or two up the cañon

we come upon a mass of much crushed and contorted schists, cut every where by quartz and jasper veins of various sizes. These quartz veins furnish the pebbles found in the later sandstone and clayey layers, together with cobbles composed of the harder parts of the schistose rock. The sandstones lie unconformably against and over the schist, somewhat as at Redding. The lower layers as described are full of worn fragments of shells but more in thin flat irregular shape, condition or position. The upper layers vary in composition, but are more largely sandy, and with numerous sandy concretions surrounded with thin layers of iron oxide, and here and there vegetable remains but

very few quartzite pebbles and practically destitute of fossils. The layers are of various thicknesses and succeed one another with something like regularity. The upper layers are frequently pale greenish or whitish where weathered, or a little more blue internally. They weather easily and fragments exposed to the air gradually slack up into loose sand. Here and there are clayey layers or lenticular masses which intercept the infiltrated iron and are often much hardened by it. The uppermost beds as a rule become somewhat more horizontal than those below and above them all, unformably to their craggy edges is a layer (5-10 ft) of clayey soil full of pebbles of all sizes, up to cobbles, and also

the weathered concretions of
the underlying sandstones.
The beds of the brooks are full
of the gravel and pebbles
which were first derived
from the schists but which
have now utilized more or
less in the subsequent strata
and may have been washed
out from any of them.
The talus at the spurs of
the hills side often almost
wholly composed of this
gravel the finer material
having been carried away.
The flat part of the valley
both south is largely com-
posed of brown earth lying
in the uppermost bed de-
scribed mixed with vegetable
matter. Further north there
is in the valley and on
many of the foothills a
very deep layer of the so-called
"black adobe" a black clayey

lorn which is very soft and in wet weather forms an almost impassable mire and in dry weather shrinks and cracks in all directions.

The miocene sandstones of

which the hills are chiefly made up attain a thickness of several hundred feet without any duplication being counted in.

The Teesapard Creek flows westward from the flanks of Mt. Diablo and with its tributaries about ten or twelve miles northward from Livermore. This creek was followed for eight or nine miles up to its headwaters in the hills. It issues by the junction of two brooks from a narrow canon on the SW flank of Mt. Diablo. Some of the springs which feed it are impregnated with sulphur and

Magnesia and give off fumes of sulphuretted hydrogen. Just at the entrance the strata are nearly vertical the dip being toward Mt. Diablo and further away from the mountain the spur which bounds the valley to the south is composed of strata which dip toward the mountain at right angles to the axis of the spur from 95° to 45° degrees the dip decreasing distally. At the entrance of the canon to the north the strata most prominent are of a compacted friable conglomerate of river pebbles with very little fine material containing occasional robust fossils, such as the heavy shell of *Ostrea*. This material varies in hardness and weatheres into fantastic shapes. Further up the canon on the right hand it

of the road is a section of some of the whitish sandstone fine and nonfossiliferous (specimen). It weathers yellowish white or pale greenish, and appears below in the valley at each side as a well defined stratum, at intervals. After issuing from the cañon, the Tessaja and flows through a flat alluvial bottom, of material derived from the adjacent hills deposited in nearly horizontal layers and covered to a considerable depth (5-10') with black adobe. Through this material are sparingly scattered worn fossils, derived from the sandstone, mostly trilobites.

Somewhere about the headwaters of this creek according to Dr. J. G. Cooper, some years ago, yester evening some fresh

water mark, the shells, according to Stearns, offering some rather remarkable peculiarities. This Cooper supposed to be Pliocene, and my trip involving some 45 miles of driving was undertaken in the hope of re-discovering this bed, but for want of a more specific location we did not succeed in finding the mark which might have been restricted to a small area. The Tewajara cuts a very deep channel in the alluvial, being sometimes thirty or more feet below the surface of the alluvial and the banks nearly vertical in many places. of this bank ten or more feet may consist of black shale, though often less and the rest of the bank gravelly layers, the bed of the creek being sometimes formed by the latter and

stones and in other places
of alluvial or gravel derived
from the alluvial,
as the traveller goes north
the land is more fertile; as
he goes south from the
valley toward the schist
it becomes less and less so
until it is practically bare.

Livermore Valley

Arroyo Mocko

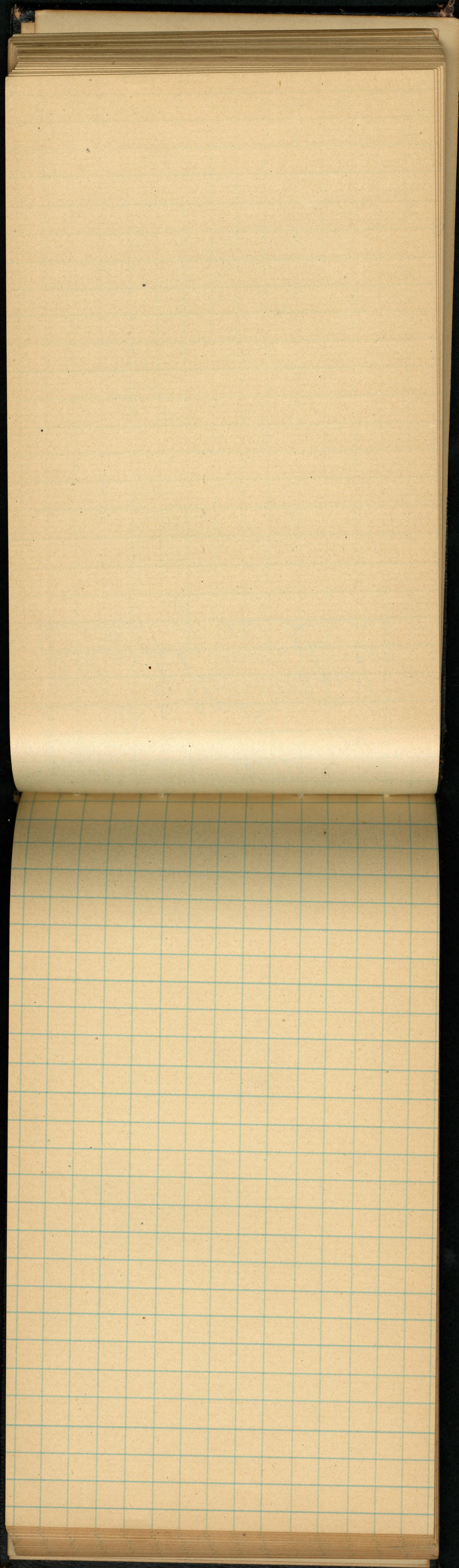
This valley is the next NE from Arroyo del Valle and is separated from it by a high divide. The lower part of it though wider is much like the Arroyo del Valle the rocks being apparently all of the tilted sandstones. About nine miles from Livermore (the road gradually descending on or near the crest of the SW. divide) the summit which is of an extremely soft sandstone or sandy soil which gives way where the road goes off suddenly exhibits the schists which I had previously observed in a side canon of the del Valle. They are in a much carbonated state and above graduate into a shaly rock consisting largely

days of iron oxide which has been
mined & ground for paint.
The presence of iron in varying
degrees makes the schists
polychromed, and from fissures
in them at about ten miles
from Livermore issue the
mineral springs of Agua
Vida, owned by Mr. Mor-
denhall (circular & analyses)
and supposed to be useful for
kidney & rheumatic complaints.
The altitude of the springs is
1750 feet above the sea.
Above the schists the clayey
shales have in places decom-
posed into clay. I observed
no fossils in them.

Dry canon -

This branch of the Arroyo del
Valle extends eastward from the
 latter and presents on its N.W.
 side some interesting effects of
 erosion by rain upon a very
 soft sandy rock with numerous

small gravel stones in it, or
perhaps one might better
term it a sandy gravel
cliff. Of this I hope to get
photographs through the
kindness of Mr. Hammond.



2 undershirts
2 shirts
2 draws
2 socks
6 handkerchiefs
3 pr cuffs
8 collars
1 - sl. cover



